

Page 1

Stop *NR2*

Quality Control

04/12/04/24

B.a 12/04/26
SL 12/04/29

12/04/26
12/04/29

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 83135

Friday, April 13, 2012 10:09:57 AM

83135

Page 2

Item ID: D2741 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: Blade, 350 Skidtube
Start Date: 4/13/2012 Start Qty: 40.00 ***40*** Cust Item ID:
Required Date: 4/25/2012 Req'd Qty: 40.00 ***40*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130 *130* QC Quality Control	QC8- Inspect parts - second check Memo	0.00 0.00		<i>12/04/30</i>		<u>40</u>	<u>0</u>		
140 *140* Small Fab Small Fab	Small Fab Memo 1-Deburr2-Bend per Dwg D2741	0.00 0.00				<u>40</u>	<u>0</u>		<i>8/2/05/01</i>
150 *150* QC Quality Control	QC5- Inspect part completeness to step on W/O Memo	0.00 0.00		<i>8/2/05/01</i>		<u><i>count</i> 40</u>			

W/O:		WORK ORDER CHANGES					
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 83135

Friday, April 13, 2012 10:09:58 AM

83135

Page 4

Item ID: D2741

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Blade, 350 Skidtube

Start Date: 4/13/2012 Start Qty: 40.00

40

Cust Item ID:

Required Date: 4/25/2012 Req'd Qty: 40.00

40

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

190

0.00

190

Small Fab

Small Fab

Memo

0.00

Small Fab

1-Pass in deburring machine2-Grind off edges

N/A h

195

0.00

195

HandFinish

Memo

0.00

Hand Finishing

clean with wash & wipe to remove oil

(40) 2/6/12 65

200

White Gloss(Ref:4.3.5.2) per QSI005 4.3-Steel

0.00

200

Powdercoat

Memo

0.00

Powder Coating

START TIME:

FINISH TIME:

OVEN TEMPERATURE:

400°F

4:10

4:40

40x 12/06/06

M121134

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Friday, April 13, 2012 10:09:58 AM

Page 5

proof

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

Friday, April 13, 2012 10:10:02 AM

Page 1

Work Order ID: 83135

83135

Parent Item: D2741

D2741

Parent Item Name: Blade, 350 Skidtube

Start Date: 4/13/2012

Required Date: 4/25/2012

Start Qty: 40.00

Required Qty: 40.00

Comments: IPP Rev: D00.11.15Removed P/O turning - in house processEC
 IPP Rev: E 06-03-20 As Per Rev C
 IPP Rev: F 06.04.20Added grinding after heat treating EC

JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
M4130NB0.500X03.00 0		Purchased		No		100	f	62.1200	1.1541	48.59368			

M4130NB0 500X03 000

4130 Bar 0.500 x 3.00

13,850

Location

Loc Qty

Loc Code

MAT034

62.12

118585

12.09

119269

2.03

→ 120572

48

48

OK 12/04/24

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order:	83135
Description: Blade		Part Number:	D2741
Inspection Dwg: D2741 Rev: C		Page 1 of 1	

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
1.500	+/-0.010	1.500	✓		Vern	GA-01
0.715	+/-0.010	0.715	✓		"	"
Ø0.516	+0.008/-0.001	Ø0.518	✓		"	"
2.000	+/-0.010	2.000	✓		"	"
13.750	+/-0.010	13.750	✓		H-G	31006
Ø1.06 x 0.150	+0.012/-0.001 x +/-0.010	1.062 x .152	✓		Vern	GA-01
2.930	+/-0.010	2.930	✓		"	"
0.375	+/-0.010	0.377	✓		"	"
0.25 x 0.25	+/-0.030	0.25 x 0.25	✓		"	"

Measured by: J.A.	Audited by: [Signature]	Prototype Approval:	N/A
Date: 12/04/26	Date: 12/04/30	Date:	N/A

Rev	Date	Change	Revised by	Approved
A	03.12.22	New Issue	KJ/RF	
B	06.03.09	Revised per Rev. C	KJ/JLM	[Signature]

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

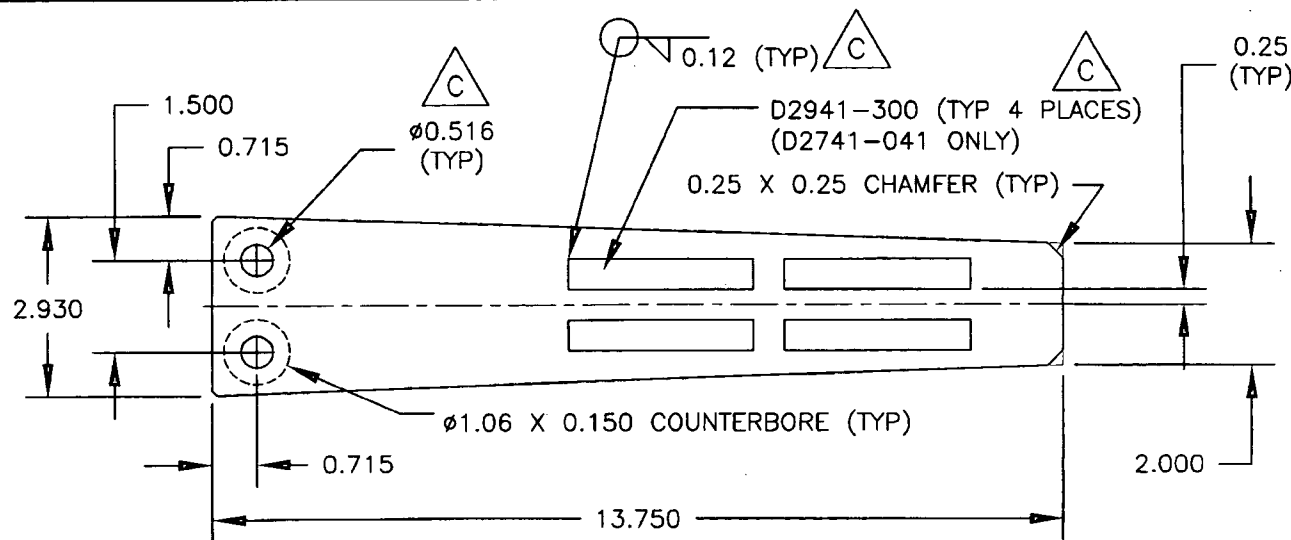
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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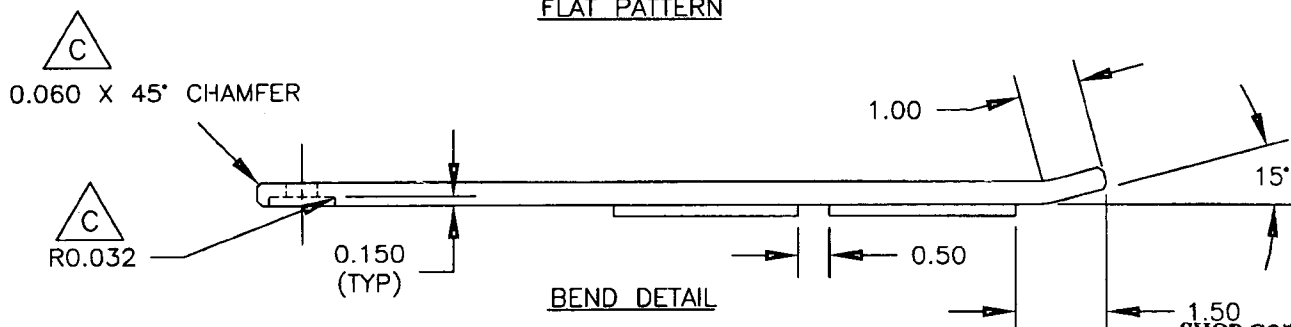
NOTE: Date & initial all entries



RELEASED
06-02-07



FLAT PATTERN



BEND DETAIL

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 83135
12-0413

D2741 BLADE

- 1) MATERIAL: AISI 4130 STEEL 0.375 THICK
MIN. ULTIMATE TENSILE STRENGTH = 152 ksi (34-40 HRC)
MIN. YIELD TENSILE STRENGTH = 141 ksi
- 2) FINISH: POWDER COAT WHITE (REF. 4.3.5.2) PER DART QSI 005 4.3
- 3) ALL DIMENSIONS ARE IN INCHES
- 4) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 5) BREAK ALL SHARP EDGES 0.030 TO 0.060
- 6) TO MAKE D2741-041, WELD D2941-300 (4) AS SHOWN ABOVE.
REMOVE POWDER COAT FROM SURFACE OF D2941-300
- 7) TO MAKE D2741-043, WELD 7560 HARDCOAT ROD INSTEAD OF D2941-300

DESIGN	PH	DRAWN BY	PH	DART AEROSPACE USA, INC.	PORT HADLOCK, WA	REV. C
CHECKED	PH	APPROVED	PH	DRAWING NO.	D2741	SHEET 1 OF 1
DATE	06.01.12	TITLE	BLADE	SCALE	1:3	
A	98.04.16	NEW ISSUE				
B	98.09.01	CHANGE C'SINK TO C'BORE				
C	06.01.12	LARGER HOLE, ADD RADIUS AND CHAMFER ADD -041/-043 OPTIONS				

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



Metcor Inc.

Metcor Inc.
560, rue Arthur-Sauvé
St-Eustache (Québec) J7R 5A8
Tél. : 450 473-1884
Télécopieur/Fax administration : 450 491-5451
Télécopieur/Fax production : 450 491-5451

Certificat de Conformité Certificate of Compliance

BON DE TRAVAIL / CHARGEMENT	order / lot
175772	1

CLIENT / customer 218
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K8A 1K7

LIVRÉ À / shipped to:
DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K8A 1K7

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	CODE DE TRAITEMENT mat'l heat code	NUMÉRO DE LOT lot number
PO18686		4183		

SPECIFICATIONS DU PROCÉDÉ

processing specifications

SEL HARDEN
HARDEN AND TEMPER
BAE AMS 2700/1 REV.15

EXIGENCE / requirement	SPECIFICATIONS / specified	TESTS EXÉCUTÉS / performed	RÉSULTATS DE TESTS / results
HARDNESS	34 - 40 HRC	40	38 - 40 HRC
TENSILE (KSI)	132 - 182 KSI		171 - 182 KSI

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
40	140	D2741 BLADE MIN. ULTIMATE TENSILE STRENGTH = 162 KSI MIN. YIELD TENSILE STRENGTH = 141 KSI (34-40 HRC) NOTE: SAND BLAST PART AFTER HEAT TREAT CONTENANT: 2 BOÎTES DE BOIS

COMMENTAIRES / comments

INSPECTEUR / inspector:



DATE: 2012-05-22

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ

ST-EUSTACHE, QC, J7R 5A8

Tel: 450-473-1884 / Fax: 450-491-5498

Certificat de Conformité Détaillé

Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
175772	1

CLIENT / customer 215

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K6A 1K7

1

COMMANDE DU CLIENT customer po	BON DE LIVRAISON DU CLIENT customer shipper no.	MATÉRIEL material	CODE DE TRAITEMENT mat'l heat code	NUMÉRO DE LOT lot number
PO16888		4130		

SPÉCIFICATIONS DU PROCÉDÉ

processing specifications

SEL HARDEN

HARDEN AND TEMPER

SAE AMS 2759/1 REV.E

EXIGENCE / requirement	SPÉCIFICATIONS / specified	TESTS EXÉCUTÉS / performed	RÉSULTATS DE TESTS / results
HARDNESS	34 - 40 HRC	40	38 - 40 HRC
TENSILE (KSI)	152 - 182 KSI		171 - 182 KSI

8
12/6/14

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
40	140	D2741 BLADE MIN ULTIMATE TENSILE STRENGTH = 152KSI MIN. YIELD TENSILE STRENGTH = 141 KSI (34-40 HRC) NOTE: SAND BLAST PART AFTER HEAT TREAT CONTENANT: 2 BOÎTES DE BOIS

Operation	Temp. spécifiée Specified Temp	Temps de trempage Spécifié Specified Soak Temp	Atmosphère	Carbone Carbon Potential	Q-Media Q-Temp	Four # Furnace #	Date Départ Start Date	Heure d'entrée Time In	Heure de sortie Time Out	Date Complétée Date complete
1.00 CONT. INIT.	LAVAGE		si nécessaire							
2.00 PREPARING	COMPTAGE									
3.00 PREHEAT 1	1000	1:00 1:30	air			134				
4.00 SEL HARDE	1575	0:40	SEL		BRINE	106				
5.00 WASH	150	0:30	soap							
6.00 SNAP TEMP	400	2:00	air			609				

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ
ST-EUSTACHE, QC, J7R 5A8

Tel: 450-473-1884 / Fax: 450-491-5498

Certificat de Conformité Détaillé

Detailed Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
175772	1

CLIENT / customer 215

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY

ON K6A 1K7

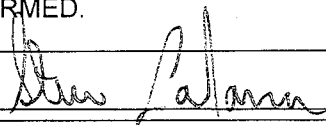
1

Operation	Temp. spécifiée Specified Temp	Temps de tremp Spécifié Specified Soak Temp	Atmosphere	Carbone Carbon Potential	Q-Media Q-Temp	Four # Furnace #	Date Départ Start Date	Heure d'entrée Time In	Heure de sortie Time Out	Date Complétée Date complete
7.00 SANDBLAS			Sablage							
8.00 DIST INSP										
9.00 TEMPER	875 +/-10°F	4 hrs	air			635				
10.00 HARDN INS										
11.00 SANDBLAS			Sablage							
12.00 HUILAGE			huile							
13.00 FINAL INSP							05-22-2012			05-22-2012

COMMENTAIRES / comments

ALL THE HEAT TREATMENT PROCESSING PERFORMED ON THIS ORDER WAS ACCOMPLISHED USING HEAT TREATMENT EQUIPEMENT THAT MEETS THE REQUIREMENTS OF AMS 2759. ALL THE HEAT TREATMENT OPERATIONS WERE ACCOMPLISHED IN ACCORDANCE WITH THE REQUESTED/REQUIRED HEAT TREATMENT SPECIFICATION AND ALL REQUIRED VERIFICATIONS TEST HAVE BEEN PERFORMED AND DOCUMENTED. NO UNAUTHORIZED CHANGES OR DEVIATIONS TO REQUIRED HEAT TREATMENT SPECIFICATIONS OR PROCEDURES HAVE BEEN PERFORMED.

APPROUVÉ par / Approved by:



DATE: 2012-05-23

/ Nous certifions que toute l'information comprise sur ce rapport est exacte et conforme aux requis du client./We certify that all the information on this report is exact and in accordance with the order requirements.